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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,384	02/17/2004	Francis Lau	GTI-1519	1625
33058	7590	09/21/2007		
MARK E. FEJER GAS TECHNOLOGY INSTITUTE 1700 SOUTH MOUNT PROSPECT ROAD DES PLAINES, IL 60018			EXAMINER MERKLING, MATTHEW J	
			ART UNIT 1764	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/780,384

Applicant(s)

LAU ET AL.

Examiner

Matthew J. Merkling

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 24-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-12 and 14-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Wachsman et al. (US 6,296,687).

Regarding the following claims, Wachsman discloses:

1. An apparatus comprising (10, Fig. 1): a carbonaceous material reactor vessel (reactor, col. 4 lines 4-13) having a carbonaceous material inlet (Feed, see Fig. 1), an hydrogen-rich gas outlet (H₂), a retentate gas outlet (Higher value products), a reaction zone (ie, reactor, see col. 4 lines 4-13), and a product gas zone containing reaction product gas (hydrogen, on opposite side of membrane 11 in reactor); and at least one permeable hydrogen-selective membrane (col. 4 lines 7-8) disposed within said reactor and having a first side in contact with said reaction product gas and an opposite second side in contact with an hydrogen-rich gas (see diagram of selected portion of reactor in Fig. 1).

2. Regarding limitations recited in claim 2 which are directed to a manner of operating disclosed system, neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said

limitations do not differentiate apparatus claims from prior art. See MPEP §2114 and 2115. Further, process limitations do not have a patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.

3. An apparatus in accordance with claim 2, wherein said at least one permeable hydrogen-selective membrane is at least one of proton conductive and electron conductive (Abstract).

4. An apparatus in accordance with claim 3, wherein said at least one permeable hydrogen-selective membrane is proton conductive and electron conductive (C3/L1-19).

5. Where the claimed and prior art product(s) are identical or substantially identical, or are produced by identical or substantially identical process(es) the burden of proof is on applicant to establish that the prior art product(s) do not necessarily or inherently possess the characteristics of the instantly claimed product(s), see *In re Best*, 195 USPQ 430.

6. An apparatus in accordance with claim 2, wherein said permeable hydrogen-selective membrane comprises a membrane material selected from the group consisting of Pd, Pd--Ag alloy, Pd--Cu alloy, perovskite-type ceramic materials, composites of Pd and ceramic materials, and combinations thereof (C3/L1-55).

7. An apparatus in accordance with claim 2, wherein said permeable hydrogen-selective membrane comprises a ceramic material of perovskite oxide having a formula $A_{1-x}A'_xB_{1-y}B'_yO_{3-z}$ where A is selected from the group consisting of Ba, Sr, Ca and Mg, A' is selected from the group consisting of La, Pr, Nd, Gd, and Yb, B and B' are selected from the group consisting of Ce, Nd, Sm, Eu, Gd, Tm, Yb and Y, O is oxygen, x and y are numbers in a range of 0 to 1, and z is a number sufficient to neutralize a charge in said perovskite oxide (C3/L1-55).

8. An apparatus in accordance with claim 2, wherein said at least one permeable hydrogen-selective membrane is disposed within a membrane module disposed within said gasification reactor vessel (Fig. 1).

10. An apparatus in accordance with claim 6, wherein said perovskite-type ceramic material comprises an electron conductive metal (C3/L1-20).

11. An apparatus in accordance with claim 10; wherein said electron conductive metal is selected from the group consisting of Ni, Pd, Pt and combinations thereof (C3/L1-20).

12. An apparatus in accordance with claim 8, wherein a solid particle, impermeable-gas permeable protective sheath is disposed around said membrane module (Fig. 1, sheath is impermeable to carbonaceous material).

14. An apparatus in accordance with claim 1, wherein said carbonaceous material reactor vessel is a gas phase reactor vessel (C3/L28-35, disclosing the operation of a gas-phase reactor). Furthermore, regarding limitations recited in claim 14 which are directed to a manner of operating disclosed system, neither

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the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP §2114 and 2115. Further, process limitations do not have a patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.

15. An apparatus in accordance with claim 14, wherein said at least one permeable hydrogen-selective membrane is at least one of proton conductive and electron conductive (C3/L1-19).

16. An apparatus in accordance with claim 15, wherein said at least one permeable hydrogen-selective membrane is proton conductive and electron conductive (C3/L1-19).

17. Where the claimed and prior art product(s) are identical or substantially identical, or are produced by identical or substantially identical process(es) the burden of proof is on applicant to establish that the prior art product(s) do not necessarily or inherently possess the characteristics of the instantly claimed product(s), see *In re Best*, 195 USPQ 430.

18. An apparatus in accordance with claim 14, wherein said permeable hydrogen-selective membrane comprises a membrane material selected from the group consisting of perovskite-type ceramic materials, composites of Pd and ceramic materials, and combinations thereof (C3/L1-55).

19. An apparatus in accordance with claim 18, wherein said permeable hydrogen-selective membrane comprises a ceramic material of perovskite oxide having a formula $A_{1-x}A'_x B_{1-y}B'_y O_{3-z}$ where A is selected from the group consisting of Ba, Sr, Ca and Mg, A' is selected from the group consisting of La, Pr, Nd, Gd, and Yb, B and B' are selected from the group consisting of Ce, Nd, Sm, Eu, Gd, Tm, Yb and Y, O is oxygen, x and y are numbers in a range of 0 to 1, and z is a number sufficient to neutralize a charge in said perovskite oxide (C3/L1-55).

20. An apparatus in accordance with claim 14, wherein said at least one permeable hydrogen-selective membrane is disposed within a membrane module disposed within said gas phase reactor vessel (C3/L28-35, disclosing the operation of a gas-phase reactor).

22. An apparatus in accordance with claim 18, wherein said perovskite-type ceramic material comprises an electron conductive metal (C3/L1-19).

23. An apparatus in accordance with claim 22, wherein said electron conductive metal is selected from the group consisting of Ni, Pd, Pt and combinations thereof (C3/L1-20).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the

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art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 9 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wachsman et al. (US 6,296,687).

Regarding claims 9 and 21, Wachsman, as discussed in claims 8 and 20 above, discloses said hydrogen-selective membrane is a wall within a reactor (col. 4 lines 4-13). Wachman does not explicitly disclose the shape of said hydrogen-selective membrane. However, having disclosed the hydrogen-selective membrane forms a wall of a reactor, the shape of said membrane is considered a mere change in shape. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the shape of said hydrogen-selective membrane to conform to the shape of said reactor that was deemed necessary by an operation. Furthermore, it has been held that a change in shape is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed apparatus was significant (*In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)).

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wachsman et al, USP 6235417 in view of Keskar et al., USP 6066307.

Regarding the following claims:

13. Wachsman discloses the apparatus in accordance with claim 2, but not wherein the gasification reactor vessel is a fluidized bed gasification reactor.

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Keskar disclose that it is favorable to utilize a fluidized bed as a gasification reactor with a membrane reformer (C2/L19-30), and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wachsman with Keskar to utilize a fluidized bed as such modification would result in improved rates of reaction for the production of gasification products (C2/L19-30).

Response to Arguments

6. Applicant's arguments filed 7/16/07 have been fully considered but they are not persuasive and furthermore, they are moot in view of the new grounds of rejection.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Merkling whose telephone number is (571) 272-9813. The examiner can normally be reached on M-F 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



MJM



Glenn Caldarone
Supervisory Patent Examiner
Technology Center 1700